

Transmittal Summary Document
ORD Manuscript Review
(ORD: #'s 1 – 8; OW Lead Office: #'s 9 – 12)

1. Manuscript Title:

HFPO-DA and PFOA in Surface Water and Soil Near a Fluoropolymer Production Facility in West Virginia

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2. Background/Overview:

Fluorochemical production facilities have been identified as major sources of poly- and perfluoroalkyl substances (PFASs) in the environment, but comparatively little work has been done to characterize the impacts these sources have in nearby communities. A further complication is the fact that many fluorochemical production companies have changed their formulation processes in recent years to achieve compliance with the USEPA's PFOA Stewardship Program. The new compounds that have been used as replacements for the long-chain materials tend to retain many of the physical/chemical/toxicological properties of the long-chain compounds they have displaced, but very little research has been conducted on these newer materials.

Perfluorooctanoic acid (PFOA) is a long-chain PFAS that was historically used as a solubilization aid in the production of the fluoropolymer polytetrafluoroethylene (PTFE or Teflon). PFOA was emitted into the environment from the DuPont (now Chemours) Washington Works fluoropolymer facility in Parkersburg, WV. Use of PFOA at this site was discontinued in 2013, and its replacement, hexafluoropropylene oxide-dimer acid or HFPO-DA (also known as GenX), is now being used as a process aid to produce PTFE fluoropolymer products. This manuscript details the presence of PFOA in surface water and soil in a large area surrounding the Washington Works facility while also documenting the discovery of the replacement compound, HFPO-DA (GenX), in the same media in this region.

3. Relevancy to NWP research needs/priorities:

[SSWR 6.02B] Characterization of sources of contaminants of emerging concern to surface water and groundwater – This manuscript provides information concerning legacy and new per and polyfluoroalkyl substances of significant concern to Regional Offices and the public.

4. Name(s) of OW reviewer(s) of earlier drafts /OW co-authors, if any:

This manuscript has been reviewed by staff in EPA Region 3 and Region 5 due to location of the study along the Ohio River. There are no Regional/Program Co-Authors. OW, OAR, R3 and R5 leadership were briefed on the work in November 2017.

5. Major observations and results:

Perfluorooctanoic acid (PFOA) was used as a fluoropolymer manufacturing aid at the Washington Works facility in Parkersburg, West Virginia from 1951 until 2013. HFPO-DA has also been used as a replacement process aid at this site since 2009. Historical releases of PFOA in this region have been partially documented, with this work being largely focused in communities downstream (southwest) on the Ohio River. This study was conducted to provide an update on the ongoing impacts from this plant and to attempt to better define the geographical area that remains impacted by historical and continuing emissions from this facility.

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To help accomplish this task, 94 surface water samples and 13 soil samples were collected from areas mainly upstream and downwind (i.e. to the north and northeast) of this facility in 2016 and 2018.

PFOA was detected in every surface water sample collected, with concentrations exceeding 1000 ng/L at 13 sample sites within an 8 km radius of the plant.

HFPO-DA was found to be widely distributed in surface water with the highest levels (>100 ng/L) within a 6.4 km radius north of the plant.

One sample site, 28 km north of the plant, had PFOA at 143 ng/L and HFPO-DA at 42 ng/L.

Several surface water samples collected adjacent to landfills known to contain fluorochemical waste from the facility had PFOA concentrations ranging up to >1000 ng/L.

PFOA was quantifiable in all but one soil sample collected in 2016 and 2018 (n= 14), with PFOA elevated at 4.96 ng/g at the most distant sample site, 48 km northeast of the facility.

The highest soil levels of PFOA and HFPO-DA were found 4.0 km (26.9 and 3.20 ng/g, respectively) and 8.5 km (18.4 and 8.14 ng/g, respectively) to the north northeast of the facility.

6. Potential implications of the findings:

This study documents the widespread occurrence of PFOA and HFPO-DA in the surface water and soil in a large area surrounding this facility. The region of measurable impacts has yet to be fully delineated. The presence of HFPO-DA at a long distance from the facility indicates the likelihood of atmospheric transport since there (1) is no other known source of HFPO-DA in the area and (2) the location is upstream of the production facility making water transport unlikely.

7. Findings advancing existing scientific knowledge:

More complete characterization of the distribution of PFOA and discovery of a new PFAS compound (HFPO-DA, or GenX) in the vicinity of a major fluorochemical production facility. Further evidence of a significant potential for atmospheric transport of PFAS, which is currently an understudied issue.

8. Publication information (journal, book chapter/book) and estimated timelines:

To be submitted for consideration for publication in *Environmental Science and Technology*.

9. Has OW's review/clearance process identified any policy statements or factual errors within the draft manuscript? If yes, please specify:

10. Date of ORD's review/clearance request received:

11. Date of OW's completion of review/clearance:

12. Attach incoming manuscript and fact sheet (including technical comments/factual errors, if any)